however, which from the context can lead to no mistake, and is consequently of no importance. Though the proof of that part of the "Report" passed under my eyes, the error entirely escaped my attention.

With regard, however, to Professor Owen's remark that throughout the "Report" the discovery of *Lagomys* in Brixham Cave is treated as an original discovery, I have simply to observe that the Report consists of one hundred pages, in which about five lines, at most, relate to *Lagomys spelæus*, in two of which the reporter observes, with perfect truth, that "it has been met with elsewhere in association with Pleistocene mammals." The statement of this well-known fact is hardly, in the usual sense of words, a claim to "original discovery."

II. "On the Tides of the Arctic Seas.—Part IV. The Tides of Northumberland Sound at the Northern Outlet of Wellington Channel.—Part V. The Tides of Refuge Cove in Wellington Channel." By the Rev. Samuel Haughton, M.D. Dublin, D.C.L. Oxon. Received July 11, 1874.

(Abstract.)

These tidal observations were made by Sir Edward Belcher, R.N., K.C.B., on board of H.M.S. 'Assistance,' in the summer of 1853. They are interesting, from the fact that they were made in the highest latitudes in which tidal observations have been ever recorded.

From a discussion of the heights and times of high and low water the following partial results have been obtained, which, it is hoped, will be further extended and corrected, by taking into account the height of the water at other phases of the tides.

Northumberland Sound.

I. *Diurnal Tide.*

1. True Solitidal Interval,

$$i_s = 7^h\ 49^m.$$

2. True Solar Coefficient, corrected for declination,

$$S = 4{\cdot}7 \text{ inches.}$$

II. *Semidiurnal Tide.*

1. Mean Lunitidal Interval (observed),

H. W.	L. W.
$+0^h\ 7^m{\cdot}05$	$6^h\ 35^m{\cdot}35.$

2. Difference between true Lunitidal and true Solitidal Intervals,

$$i_m - i_s = 38^m.$$

Refuge Cove.

I. *Diurnal Tide.*

True Lunitidal Interval,

$$i_m = 20^h\ 48^m.$$

II. *Semidiurnal Tide.*

Mean Lunitidal Interval (observed),

H. W.	L. W.
$-0^h\ 26^m{\cdot}7$.	$6^h\ 1^m{\cdot}1$.

III. "On Musical Duodenes, or the Theory of Constructing Instruments with Fixed Tones in Just or Practically Just Intonation." By Alexander J. Ellis, F.R.S., F.S.A., F.C.P.S., F.C.P. Received October 28, 1874.

This paper is intended to complete and supplement three papers on Music which I have already read before the Royal Society[1]. It contains a more complete theory of temperament, embracing that indicated by Helmholtz[2], but not worked out by him, and its application to the theory of constructing musical instruments with an intonation practically just, without change of fingering, and, if there are three or four performers, without change of mechanism. The name *Duodene* refers to that collection of *twelve* notes, suitable to the present manuals, which is made the unit of construction. To obtain its precise form, and determine the number and value of all such duodenes as it is necessary to tune, I have been obliged to indicate a theory of harmonic scales and modulation, which I believe to be entirely new, and which has of course other uses. The great extent of the subject obliges me to confine this part of my paper to a mere indication.

A. *Notation of Pitch.*

The letters C, D, E, F, G, A, B indicate both musical tones and the number of vibrations made by the prime or lowest partial tone of each in a second; so that, C being known,

$$D = \tfrac{9}{8}\,C,\ E = \tfrac{5}{4}\,C,\ F = \tfrac{4}{3}\,C,\ G = \tfrac{3}{2}\,C,\ A = \tfrac{5}{3}\,C,\ B = \tfrac{15}{8}\,C.$$

The marks ♯ ♭ † ‡ ¶ 𝄫 are used for fractional multipliers, having the following names and values:—

$$\text{sharp, } ♯ = \frac{135}{128};\quad \text{flat, } ♭ = \frac{128}{135},$$

$$\text{high, } † = \frac{81}{80};\quad \text{low, } ‡ = \frac{80}{81},$$

$$\text{skhismic, } ¶ = \frac{32805}{32768};\quad \text{hyposkhismic, } 𝄫 = \frac{32768}{32805},$$

[1] "On the Conditions, Extent, and Realization of a Perfect Musical Scale on Instruments with Fixed Tones," read Jan. 21, 1864, printed at length in Proceedings, vol. xiii. p. 93; "On the Physical Constitution and Relations of Musical Chords," and, lastly, "On the Temperament of Musical Instruments with Fixed Tones," both read on June 16, 1864, and printed at length in the Proceedings, vol. xiii. p. 392 and p. 404.

[2] Tonempfindungen, 3rd ed. p. 495.